and x-ray attenuating, said detection apparatus further capable of measuring the additional property.

55. The method of Claim 53 further comprising:

calibrating a detector array based upon the measured radiation scattering effects and the measured radiation absorption effects, wherein the calibrating enables dynamic, adaptive imaging; and

focusing the detector array at an approximate location of a radionuclide distribution based upon the calibrating.

56. The method of Claim 53 further comprising:

measuring an energy-dependent modulation transfer function of the detection apparatus.

57. A method of calibrating a radiation detection system comprising:

providing a known radiation source distribution that emits radiation, wherein the source is chosen from the group consisting of a uniform point-like source, a line-like source, a spherical source, a rod-like source, a collimated spot source, a slit source, a slot source, a grid pattern source, a planar flood field, and a shaped three-dimensional flood field,

measuring the level of radiation emitted from the source that is detected by the detection system, and

calibrating the detection system by evaluating the detected radiation and balancing the system based upon the detected radiation.

58. The method of Claim 57 further comprising:

measuring an energy-dependent modulation transfer function of the detection system, and

calibrating the system by accounting for both the detected radiation and the energy-dependent modulation transfer function.

59. A method of estimating the effects of tissue attenuation on the intensity and energy distribution of a x-ray beam comprising:

calibrating an energy-resolving detector array by determining its energy-dependent modulator transfer function,

aligning the calibrated energy-resolving detector array with the x-ray beam,

measuring a first position-dependent, energy-dependent intensity profile of the x-ray beam at the detector array,

transmitting the beam through a patient,

measuring a second position-dependent, energy-dependent intensity profile of the x-ray beam at the detector array immediately after the beam has been transmitted through the patient, and

comparing the first and the second position-dependent, energy-dependent intensity profiles of the beam.